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transmembrane module (TPU), (b) a nuclear localization sequence (NLS) and (c) a signalling and/or drug carrying module (SM), preferably having Gd, Ga, I, Fe, Mn and/or F as image creating compound.

Methods for preparing the components of the conjugates of the present invention and for coupling are, e.g., disclosed in the German Patent Application No. 199 33 492.7. The transport mediator for the cell membrane (= transmembrane module (TPU)) is an amphiphilic transport peptide~~, preferably of human origin~~, which can penetrate the plasma membrane. The length of this peptide is not subject to any limitation as long as it has the above property. The cell nucleus addressed delivery system of the present invention is based on the cell immanent Ran/Karyopherine systeme. TPUs suitable for the conjugate of the present invention can be selected according to the methods described in Example 1, e.g., by searching for peptides of human origin containing sequence homologies to the sequence of the Antennapedia peptide fragment RQIKIWFQNRRMKWKK and analysing their capability to pass the cell membrane according to the methods described in Example 1. Examples of TPUs are derived preferably from the penetratin family (Derossi et al., Trends Cell Biol. 8: 84-87, 1998) or are transportan or parts thereof (Pooga et al., The Faseb Journal 12: 68, 1998). Particularly preferred examples of TPUs are derived from Penetratin 1, Antennapedia^{1} ^{Hom}[HoxB$_5$], TP$^{(1AOP/E.coli)}$, or PTD$^{TAT/HIV1}$. Further suitable TPUs are HBX5, HBX7 and HXD9. In a preferred embodiment, the transmembrane module (TPU) is the human homeobox protein HOX-B1 ~~or a fragment~~ or derivative thereof having the same biological activity, i.e. can still pass the cell membrane.

The term "derivative" in this context means that the amino acid sequences of these molecules differ from the sequences of the original molecule (HOX-B1) (due to substitution(s), addition(s) and/or deletion(s) of one or more amino acids) at one or several

Amended Claims

1. A conjugate comprising (a) an amphiphilic transport peptide of human origin as a transmembrane module (TPU), (b) a nuclear localization sequence (NLS), wherein said nuclear localization sequence is covalently coupled to the transmembrane module via a cleavable spacer, and (c) a signalling and/or drug carrying module (SM).

2. The conjugate of claim 1, wherein the signalling and/or drug carrying module comprises Gd, Ga, Mn, I, Fe and/or F as (diagnostic) image creating compound.

3. The conjugate of claim 1 or 2, wherein the transmembrane module (TPU) is the human homeobox protein HOX-B1 or a ~~fragment or~~ derivative thereof having an amino acid sequence identity to HOX-B1 of at least 60% ~~substantially the same biological activity~~.

4. The conjugate of claim 3, wherein the transmembrane module (TPU) comprises the amino acid sequence TQVKIWFQNRRMKQKK.

5. The conjugate according to any one of claims 1 to 4, wherein the nuclear localization sequence (NLS) comprises the amino acid sequence PKKKRKV or KPKRVKK.

6. The conjugate according to any one of claims 1 to 5, wherein ~~the transmembrane module (TPU) is coupled to the nuclear localization sequence (NLS) via a covalently cleavable spacer I and/or~~ the nuclear localization sequence (NLS) is coupled to the signalling and/or drug carrying module (SM) or a compound trapping the signalling and/or drug carrying module (SM) via a non-cleavable spacer II.

7. The conjugate according to claim 6, wherein spacer I

comprises a cleavable disulfide bridge.

8. The conjugate according to claim 7, wherein spacer II is polylysine.

9. The conjugate according to any one of claims 6 to 8, wherein spacer II carries an FITC label.

10. The conjugate according to any one of claims 1 to 9, wherein the conjugate has the following structure: transmembrane module (TPU) - spacer I - nuclear localization sequence (NLS) - spacer II - signalling and/or drug carrying module (SM) or compound trapping the signalling and/or drug carrying module + signalling and/or drug carrying module (SM).

11. The conjugate of any one of claims 1 to 10, wherein said conjugate further comprises a cytotoxic drug.

12. Use of the conjugate of any one of claims 1 to 10 for the preparation of a diagnostic composition for cell tracking.

13. Use of the conjugate of any one of claims 1 to 10 for the preparation of a contrast agent for MRI.

14. Use of the conjugate of any one of claims 1 to 10 for the preparation of a diagnostic composition for determining the activity of DNA repair enzymes.

15. Use of the conjugate of any one of claims 1 to 11 for the preparation of a pharmaceutical composition for the chemotherapeutical treatment of a tumor.

16. Use of the conjugate of any one of claims 1 to 11 for the preparation of a pharmaceutical composition for the intranuclear GNCT-treatment of a tumor.